

ATTACHMENT B

**ENGINEERING STATEMENT
COMPARISON OF VHF AND UHF TELEVISION SERVICE
MM DOCKET NO. 98-35**

This engineering statement describes the coverage differences imposed by the part of the allotted television spectrum assigned for use by television broadcasters.

The Commission has defined grades of television service as follows:

"Grade A service is so specified that a quality acceptable to the median observer is expected to be available for at least 90% of the time at the best 70% of receiver locations at the outer limits of this service. In the case of Grade B service the figures are 90% of the time and 50% of the locations."¹

In general, the Grade B contour is considered the outer limit of service, and is a useful guide in comparing service provided by various facilities.

In Zone I (the northeastern part of the United States), height above average terrain (HAAT), without reduction of effective radiated power (ERP), is limited to 305 meters for VHF stations. Most VHF stations in Zone I operate at, or near, that height. Furthermore, almost without exception, VHF stations use maximum permitted ERP of 100 kilowatts for low VHF (channels 2 - 6) and 316 kilowatts for high VHF (channels 7 - 13). Although UHF stations (channels 14 - 69) are not limited to HAAT of 305 feet in Zone I, and, pursuant to FCC rules, would be allowed to achieve HAAT of 610 meters, air hazard, local zoning, and cost considerations normally result in limiting UHF HAAT to 305 or 366 meters.

¹ Third Notice of Further Proposed Rule Making, Docket Nos. 8736 *et al*, FCC Report 51-244, March 21, 1951, issued March 22, 1951.

Furthermore, UHF stations rarely achieve ERP in excess of 2,500 kilowatts because of the power required from the transmitter in order to achieve greater ERP. In those cases where the maximum permitted ERP of 5,000 kilowatts is achieved, it is through the use of a directional antenna that restricts power in some directions in order to obtain the maximum over a restricted range of bearings.

The typical Zone I UHF station operating with ERP of 2,500 kilowatts and HAAT of 305 meters achieves Grade B area coverage of only 54.8 percent of the Grade B area coverage of a low band VHF station operating with ERP of 100 kilowatts and HAAT of 305 meters. Grade B area coverage of the UHF station is only 64.7 percent of the area coverage of a high band VHF station operating with ERP of 316 kilowatts and HAAT of 305 meters. If the UHF station is able to increase HAAT to 366 meters, the percentages become 63.7 and 75.2 compared to low band VHF and high band VHF, respectively.

In Zone III (the Gulf Coast region) and Zone II (all of the country outside Zones I and III), VHF HAAT is permitted to rise to 610 meters without reduction in permitted ERP. Some VHF, and fewer UHF stations achieve HAAT of as much as 610 meters. The order of 457 meters is more common. When a UHF station operating with ERP of 2,500 kilowatts and HAAT of 457 meters is compared with VHF stations operating at their maximum permitted ERP and HAAT of 457 meters, the UHF station is found to provide Grade B

coverage area of only 58.6 percent of the low band VHF station and only 66.8 percent of the high band VHF station.

Although no UHF station achieves nondirectional ERP of 5,000 kilowatts, coupled with maximum HAAT of 610 meters, the comparison of such a station with maximum VHF operations (achieved in a number of cases) is interesting. A maximum UHF facility can achieve Grade B area coverage of only 69.1 percent of the maximum low band VHF Grade B area coverage, and only 79.2 percent of the maximum high band VHF Grade B area coverage.

The disparity between UHF and VHF service potentials will continue with the replacement of the currently used NTSC mode of operation by the digital television system adopted by the Commission. Although reliable digital television service can be achieved with less signal strength than that required for satisfactory NTSC service, the differences in propagation affecting UHF service adversely remain. Even when a television station currently broadcasting NTSC service on a VHF channel is assigned a UHF channel for the digital service, the station power level is selected to overcome the UHF handicap. At the end of the transition period, such a station is likely to return to its VHF channel for digital transmission, thus perpetuating the VHF/UHF disparity.

Although the Commission has given consent to the use of innovative practices, such as extreme beam tilt, to permit a UHF station to enhance signal strength in the central portion

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of its market, the outer reach of the station may not be increased correspondingly. In some instances, a licensee may be able to show that an increase in power can be accomplished without causing more than minimal interference to other authorized proposals. However, since the allotment plan was based on the lower power assigned, and stations are tightly packed within the available spectrum, power increase is not universally available to all users of the UHF spectrum. When such power increase is available, the UHF station must bear substantially greater capital expenditures and operating costs than its VHF competitor to achieve the maximum potential of the UHF operation which is still not likely to match the reach of the VHF station.



Jules Cohen, P.E.

July 17, 1998

CERTIFICATE OF SERVICE

I, LaVonnia Brown, do hereby certify that on this 21st day of July, 1998, copies of the foregoing "Joint Comments" were delivered by hand to the following parties:

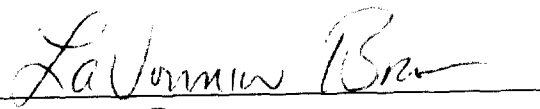
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